

We claim:

1. An apparatus for creating a data file having a format amenable to processing and storage in a computer, said data file representing a natural color three-dimensional image of at least a portion of a surface of a three-dimensional subject, said apparatus comprising:

a plurality of scanners, each of which provides means for obtaining a natural color image of a portion of said surface of said subject; and  
computer means for controlling said scanners, capturing images from said scanners in electronic form, correlating said images, creating a data file containing information regarding contour and coloration of said subject therefrom, and storing said data file;

wherein each of said scanners is comprised of:

projector means for illuminating a portion of said surface of said subject and establishing visible fiduciary indications thereupon; and

digital camera means for obtaining an image of said portion of said surface of said subject and said visible fiduciary indications thereupon;

wherein said projector means and said digital camera means are disposed such that optical axes thereof define an optical center situated at a location approximately on said surface of said subject, and an included angle having its apex coincident with said optical center;

wherein said scanners are individually and collectively disposed in locations such that collectively, said scanners obtain overlapping images from at least a portion of said surface of said subject; and

wherein said computer means comprise both hardware and software means.

2. The apparatus as recited in Claim 1, comprising at least six of said scanners.

3. The apparatus as recited in Claim 2, wherein two of said scanners are disposed directly in front of said subject, two of said scanners are disposed to left and right front aspects of said subject and two of said scanners are disposed to left and right rear aspects of said subject.

4. The apparatus as recited in Claim 1, wherein said scanners are disposed symmetrically with respect to said subject.

5. The apparatus as recited in Claim 1, wherein said included angle of each of said scanners is less than about ten degrees.

6. The apparatus as recited in Claim 4, wherein said included angle of each scanner lies in a vertical plane.

7. The apparatus as recited in Claim 1, additionally comprising means for supporting said scanners and holding said scanners securely in their respective positions.

8. The apparatus as recited in Claim 7, additionally comprising means for controlling illumination of said subject by ambient light and for providing a background of a uniform color for said images.

9. The apparatus as recited in Claim 1, additionally comprising means for viewing said data file stored in said computer means.

10. The apparatus as recited in Claim 9, wherein said means for viewing comprises means for creating a two-dimensional image on an electronic viewing screen.

11. The apparatus as recited in Claim 9, wherein said means for viewing comprises means for printing a two-dimensional representation of said data file onto a flat surface.

12. The apparatus as recited in Claim 9, wherein said means for viewing comprises holographic projection means for creating a three-dimensional holographic image.

13. The apparatus as recited in Claim 1, additionally comprising means for manufacturing a three-dimensional model in response to data in said data file.

14. The apparatus as recited in Claim 13, wherein said means for manufacturing employs additive technology.

15. The apparatus as recited in Claim 1, wherein said computer means provides at least the following functions:

- a) Controlling a sequence in which images are gathered from said scanners;
- b) Controlling placement of said visual fiduciary indications on said surface of said subject;
- c) Collecting images from each of said scanners;
- d) Correlating said images; and
- e) Storing said correlated images as a data file.

16. A method for creating a data file of a three-dimensional image representing at least a portion of a surface of a three-dimensional subject, said method comprising the steps of:

- a) Disposing said subject at a location such that it is simultaneously within view of a plurality of scanners;
- b) Illuminating said subject and simultaneously capturing an image of said subject with each of said scanners, and storing said images in an individual data file;
- c) Illuminating said subject with projector means incorporated in a first scanner, wherein said projector means provides visible fiduciary indications on said surface of said subject;
- d) Capturing an image with digital camera means incorporated in said first scanner, and storing said image in a computer means, in a form of an individual computer file;
- e) Displacing said visual fiduciary indications and repeating steps c) and d), set forth hereinabove, as many times as may be required to obtain adequate resolution between visible fiduciary indications for said scanner,
- f) Repeating steps c), d) and e) for each of the other scanners employed in said method;
- g) Correlating said individual computer files to obtain said data file representing a three-dimensional image of said subject; and
- h) Storing said data file in said computer means.

17. A method for manufacturing a three-dimensional model of a three-dimensional subject comprising the steps of creating a computer file, using the method as recited in Claim 16, and further comprising the step of creating a natural color three-dimensional model from data contained in said computer file.

18. A method for manufacturing a three-dimensional model of a three-dimensional subject as recited in Claim 17, wherein said step of creating a natural color three-dimensional model incorporates additive technology.

19. A method for manufacturing a natural color three-dimensional model of a three-dimensional subject as recited in Claim 18, wherein said additive technology is a 3D printing technology.

20. A method for manufacturing a natural color three-dimensional model of a three-dimensional subject as recited in Claim 17, wherein said model is smaller than said subject.

21. A method for manufacturing a natural color three-dimensional model of a three-dimensional subject as recited in Claim 17, wherein said model is larger than said subject.

22. A natural color three-dimensional model of a three-dimensional subject made using the apparatus as recited in Claim 13.

23. A natural color three-dimensional model of a three-dimensional subject made by the method as recited in Claim 17.

24. A natural color three-dimensional model of a three-dimensional subject, as recited in Claim 23, wherein said subject is a living person.

25. The model as recited in Claim 24, wherein the model provides an accurate representation of hair on said subject.